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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/854,759 | 05/14/2001 | Michael B. Ball | 4589US (99-1151) | 8899 |

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EXAMINER

HARAN, JOHN T

| ART UNIT | PAPER NUMBER |
|----------|--------------|
| 1733 | 5 |

DATE MAILED: 11/20/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

AS5

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 09/854,759 | BALL ET AL. | |
| | Examiner | Art Unit | |
| | John T. Haran | 1733 | |

-- The MAILING DATE of this communication appears in the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on 14 May 2001.

2a) ☐ This action is **FINAL**.

2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) 1-75 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) 1-75 is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) ☒ The proposed drawing correction filed on 28 September 2001 is: a) ☒ approved b) ☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☐ All b) ☐ Some * c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. _____.

3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.

4) ☐ Interview Summary (PTO-413) Paper No(s). _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-6, 10-17, 21-27, 31-37, 41-49, 51-55, 57-64, and 66-73 are rejected under 35 U.S.C. 103(a) as being unpatentable over Satoh (U.S. Patent 6,338,980).

Satoh discloses a method for manufacturing chip-scale packages and IC chips wherein a wafer is provided with bumps (projecting electrodes) on an active surface of the wafer, the adhering face of an adhesive member, such as a tape, is applied to the active face of the wafer thereby covering and protecting the bumps and the other face is attached to a table (wafer mount) by vacuum attraction (suction), and then the inactive face of the wafer is thinned through grinding (See abstract; Column 3, lines 27-50; and Column 6, lines 10-17). Also as illustrated in Figure 1C the adhesive face of the adhesive member conforms to the shape of the bumps and the nonadhesive face (backing) is a substantially planar surface. Satoh is silent towards the adhesive member having a backing.

Satoh discloses the adhesive member can have one adhesive face or two adhesive faces and can be a tape or a resin or rubber plate with an adhesive face (Column 10, lines 10-16). One skilled in the art would have readily realized

that numerous possibilities exist for obtaining an adhesive member with one adhesive face and one nonadhesive face such as a nonadhesive film, resin plate, or rubber plate, that is rendered adhesive on one face while leaving the other face nonadhesive through heating or an adhesive film that is adhesive on both sides and is provided with a cover film or backing layer on one side to provide a nonadhesive side or providing a nonadhesive film with an adhesive coating on one side, all of which are well known and conventional methods for obtaining an adhesive member with one adhesive face and one nonadhesive face. One skilled in the art would have readily appreciated that they are all alternate expedients that are all obvious one over the other. It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide an adhesive member or tape that has a backing, as is notoriously well known and conventional in the method of Satoh.

Regarding claim 12, one skilled in the art would have readily appreciated that it is well known and conventional when providing a backing to an adhesive member that either the adhesive is applied to an object first and then the backing is applied or the adhesive is applied to the backing and then the adhesive is applied to an object. The two are alternative expedients and are obvious one over the other. It would have been obvious to one of ordinary skill in the art to provide the adhesive to the active surface of the wafer and then apply the backing in the method of Satoh.

Regarding claims 11, 22, 32, and 42, while Satoh teaches thinning through grinding, it is also well known and conventional to thin through chemical-

mechanical polishing. It would have been obvious to thin the wafer using the well known and conventional technique of chemical-mechanical polishing in the method of Satoh, as modified above.

3. Claims 7-9, 18-20, 28-30, 38-40, 50, 56, 65, and 74-75 are rejected under 35 U.S.C. 103(a) as being unpatentable over Satoh (U.S. Patent 6,338,980) as applied above, and further in view of the admitted prior art.

Satoh is silent towards the thickness of the wafer pre and post thinning, but does teach thinning the wafer 100 micrometers (about 4 mil) as an example (Column 8, lines 12-13).

The admitted prior art teaches that a wafer must be at least 12 mils thick to undergo the bumping process without damaging the wafer (Specification, page 3, paragraph 5).

One skilled in the art would have readily appreciated performing the bumping process to the wafer at the lowest permissible wafer thickness to minimize the amount of wafer material that needs to be thinned and thinning the wafer to the ultimate desired thickness. The ultimate thickness of the wafer is within the purview of one skilled in the art and as taught in both the admitted prior art and Satoh it is desired to minimize the size of the wafer thickness. It would have been obvious to one of ordinary skill in the art at the time the invention was made to bump the wafer surface when it has a thickness of at least 12 mil and to thin it to at least 6 mils in the method of Satoh, as modified above.

4. Claims 1-75 rejected under 35 U.S.C. 103(a) as being obvious over Grigg et al (US 2002/0068453).

5. The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any

invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). For applications filed on or after November 29, 1999, this rejection might also be overcome by showing that the subject matter of the reference and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person. See MPEP § 706.02(I)(1) and § 706.02(I)(2).

6. Grigg et al is directed to a method for making thin-flip chips up to 6 mil wherein a wafer has bumps formed on an active surface, a molding compound is applied between the bumps, an adhesive face tape is placed over the tops of the bumps and the inactive surface of the wafer is thinned (page 4, paragraphs 34

and 35 and page 8, paragraph 65). Grigg et al is silent towards the tape being mounted to a wafer mount via suction however such is well known and conventional, as noted in Grigg et al (page 1, paragraph 10). It would have been obvious to one of ordinary skill in the art at the time the invention was made to place the wafer assembly on a wafer mount and to hold it on the wafer mount via suction in the method of Grigg et al.

Grigg et al are also silent towards the adhesive member having a backing.

One skilled in the art would have readily recognized that there is no need for the other side of the facing tape to be adhesive. One skilled in the art would have readily realized that numerous possibilities exist for obtaining an adhesive member with one adhesive face and one nonadhesive face such as a nonadhesive film, resin plate, or rubber plate, that is rendered adhesive on one face while leaving the other face nonadhesive through heating or an adhesive film that is adhesive on both sides and is provided with a cover film or backing layer on one side to provide a nonadhesive side or providing a nonadhesive film with an adhesive coating on one side, all of which are well known and conventional methods for obtaining an adhesive member with one adhesive face and one nonadhesive face. One skilled in the art would have readily appreciated that they are all alternate expedients that are all obvious one over the other. It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a facing tape that has a backing, as is well known and conventional in the method of Grigg et al, as modified above.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Saitoh (U.S. Patent 6,060,373) teaches a method for making flip chip semiconductor devices wherein bumps are formed on a wafer the bumps are covered with a protective film, an adhesive tape is attached to the protective film and the back of the wafer is thinned through grinding.


8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **John T. Haran** whose telephone number is **(703) 305-0052**. The examiner can normally be reached on M-Th (8 - 5) and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael W. Ball can be reached on (703) 308-2058. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.


John T. Haran

November 14, 2002


Michael W. Ball
Supervisory Patent Examiner
Technology Center 1700